

In the Claims

1. (currently amended) A composition comprising:
a nano-particle core comprising a first conductive material comprising a metal, a metal alloy,
a conductive polymer, or any combination thereof, and
a nano-structure formed on an outer surface of the core, where the nano-structure comprises
a second conductive material comprising a metal, a metal alloy, or any combination thereof,
where the first and second conductive materials are the same or different. ~~a nano-particle core
and a nano-structure formed on an outer surface of the core, where the nano-particle core comprises
a first conductive material and the nano-structure comprises a second conductive material, where the
first and second conductive materials are the same or different.~~

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1 49.(new) The composition of 1, wherein the nano-structure comprises a nano-shell, a plurality
2 of nano-rods, or a nano-shell having a plurality of nano-rods disposed on a surface of the nano-shell.

1 50.(new) The composition of 1, wherein the metals and metal alloys are selected from the
2 group consisting of non-transition metals, non-transition metal alloys, transition metals, transition
3 metal alloys, lanthanide metals, lanthanide metal alloys, actinide metals, actinide metal alloys and
4 any combination thereof.

1 51.(new) The composition of claim 1, wherein the metal and metal alloys are noble metals or
2 noble metal alloys, where the noble metals are selected from the group consisting of gold, silver,
3 platinum, palladium, iridium, osmium, ruthenium, rhodium, and any combination thereof.

1 52.(new) The composition of claim 1, wherein the nano-structure has a plasmon resonance.

1 53.(new) The composition of claim 52, wherein the plasmon resonance has a frequency range
2 at least a portion of which lies in the near infrared region of the electromagnetic spectrum.

1 54.(new) A composition comprising:

2 a nano-particle core comprising a first conductive material selected from the group consisting
3 of a metal, a metal alloy, and any combination thereof, and

4 a nano-structure formed on an outer surface of the core, where the nano-structure comprises
5 a second conductive material selected from the group consisting of a metal, a metal alloy, and any
6 combination thereof,

7 where the first and second conductive materials are the same or different.

1 55.(new) The composition of 54, wherein the nano-structure comprises a nano-shell, a plurality
2 of nano-rods, or a nano-shell having a plurality of nano-rods disposed on a surface of the nano-shell.

1 56.(new) The composition of claim 54, wherein the metals and metal alloys are selected from
2 the group consisting of non-transition metals, non-transition metal alloys, transition metals, transition
3 metal alloys, lanthanide metals, lanthanide metal alloys, actinide metals, actinide metal alloys and
4 any combination thereof.

1 57.(new) The composition of claim 54, wherein the metal and metal alloys are noble metals
2 or noble metal alloys, where the noble metals are selected from the group consisting of gold, silver,
3 platinum, palladium, iridium, osmium, ruthenium, rhodium, and any combination thereof.

1 58.(new) The composition of claim 54, wherein the nano-structure has a plasmon resonance
2 having a frequency range at least a portion of which lies in the near infrared region of the
3 electromagnetic spectrum.

1 59.(new) A composition comprising:

2 a nano-particle core comprising a first conductive material comprising a metal, a metal alloy,
3 a conductive polymer, or any combination thereof, and

4 a nano-structure formed on an outer surface of the core,

5 where the nano-structure is selected from the group consisting of a nano-shell, a plurality of
6 nano-rods, and a nano-shell having a plurality of nano-rods disposed on a surface of the nano-shell,

7 where the nano-structure comprises a second conductive material comprising a metal, a metal

8 alloy, or any combination thereof,

9 where the nano-rods comprise a third conductive material comprises a metal, a metal alloy,
10 or any combination thereof, and

11 where the first, second and third conductive materials are the same or different.

1 60.(new) The composition of claim 59, wherein the metals and metal alloys are selected from
2 the group consisting of non-transition metals, non-transition metal alloys, transition metals, transition
3 metal alloys, lanthanide metals, lanthanide metal alloys, actinide metals, actinide metal alloys and
4 any combination thereof.

1 61.(new) The composition of claim 59, wherein the metal and metal alloys are noble metals
2 or noble metal alloys, where the noble metals are selected from the group consisting of gold, silver,
3 platinum, palladium, iridium, osmium, ruthenium, rhodium, and mixtures or combinations thereof.

1 62.(new) The composition of claim 59, wherein the nano-structure has a plasmon resonance.

1 63.(new) The composition of claim 62, wherein the plasmon resonance has a frequency range
2 at least a portion of which lies in the near infrared region of the electromagnetic spectrum.

1 64.(new) A composition comprising:
2 a nano-particle core comprising a first conductive material selected from the group consisting
3 of a metal, a metal alloy, and any combination thereof, and
4 a nano-structure formed on an outer surface of the core,
5 where the nano-structure is selected from the group consisting of a nano-shell, a plurality of
6 nano-rods, and a nano-shell having a plurality of nano-rods disposed on a surface of the nano-shell,
7 where the nano-structure comprises a second conductive material selected from the group
8 consisting of a metal, a metal alloy, and any combination thereof,
9 where the nano-rods comprise a third conductive material selected from the group consisting
10 a metal, a metal alloy, and any combination thereof, and
11 where the first, second and third conductive materials are the same or different.

1 65.(new) The composition of claim 64, wherein the metals and metal alloys are selected from
2 the group consisting of non-transition metals, non-transition metal alloys, transition metals, transition
3 metal alloys, lanthanide metals, lanthanide metal alloys, actinide metals, actinide metal alloys and
4 any combination thereof.

1 66.(new) The composition of claim 64, wherein the metal and metal alloys are noble metals
2 or noble metal alloys, where the noble metals are selected from the group consisting of gold, silver,
3 platinum, palladium, iridium, osmium, ruthenium, rhodium, and any combination thereof.

1 67.(new) The composition of claim 64, wherein the nano-structure has a plasmon resonance
2 having a frequency range at least a portion of which lies in the near infrared region of the
3 electromagnetic spectrum.